Model 243 LPCO Regulator Brochure

UTILITY SOLUTIONS GROUP

Introduction

Who We Are

Utility Solutions Group is a manufacturer of natural gas regulators and relief valves based in Columbus, OH. All products are made in the USA and compliant with the requirements of the Build America, Buy America Act. Utility Solutions Group's Quality Management System is certified to ISO 9001 by Smithers Quality Assessments.

243 LPCO Regulators

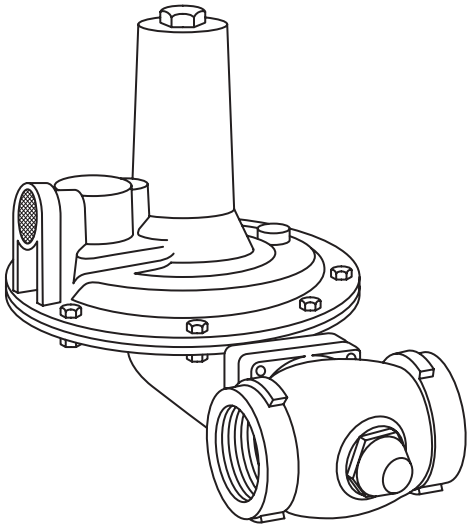
The low-pressure cut off (LPCO) is used to automatically shut off the gas when inlet pressure is no longer large enough for the required flow. It is an optional, extra safety device that is integrated into the regulator.

During normal operation, the 243 provides accurate control over pressure of gas delivery. If a line break or other issue causes the regulator to open excessively as it attempts to handle the flow demand, the cut off halts the flow of gas. This helps prevent a hazardous condition from developing on the service side of the regulator.

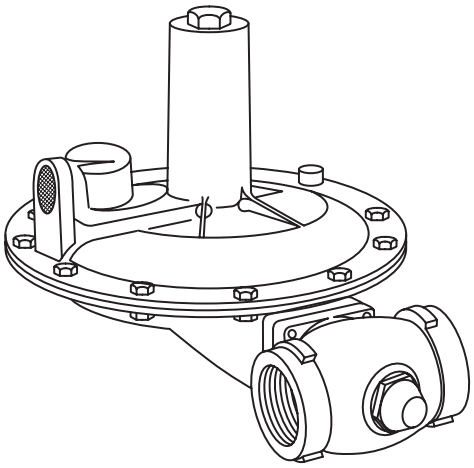
As an added protection, the LPCO does not reset itself, even if inlet pressure returns to normal. Instead, it must be manually reset, thus preventing a pressure malfunction from occurring unnoticed.

NOTE: Internal construction and capacities of these regulators are provided on Pages 3 and 4. These regulators are also available with an internal relief valve (IRV). References to the term "standard" indicate non-IRV configurations. Cut off data is given in the curves on Page 5. These show the relationship between inlet pressure and flow for the various orifice sizes. Bodies are constructed of cast iron (ASTM A126-Class B). Diaphragm cases are die-cast aluminum alloy. For additional information, please contact your Utility Solutions Group Representative or Authorized Distributor.

243-8-6 LPCO with IRV



243-12-12 LPCO with IRV



Maximum Inlet Pressure

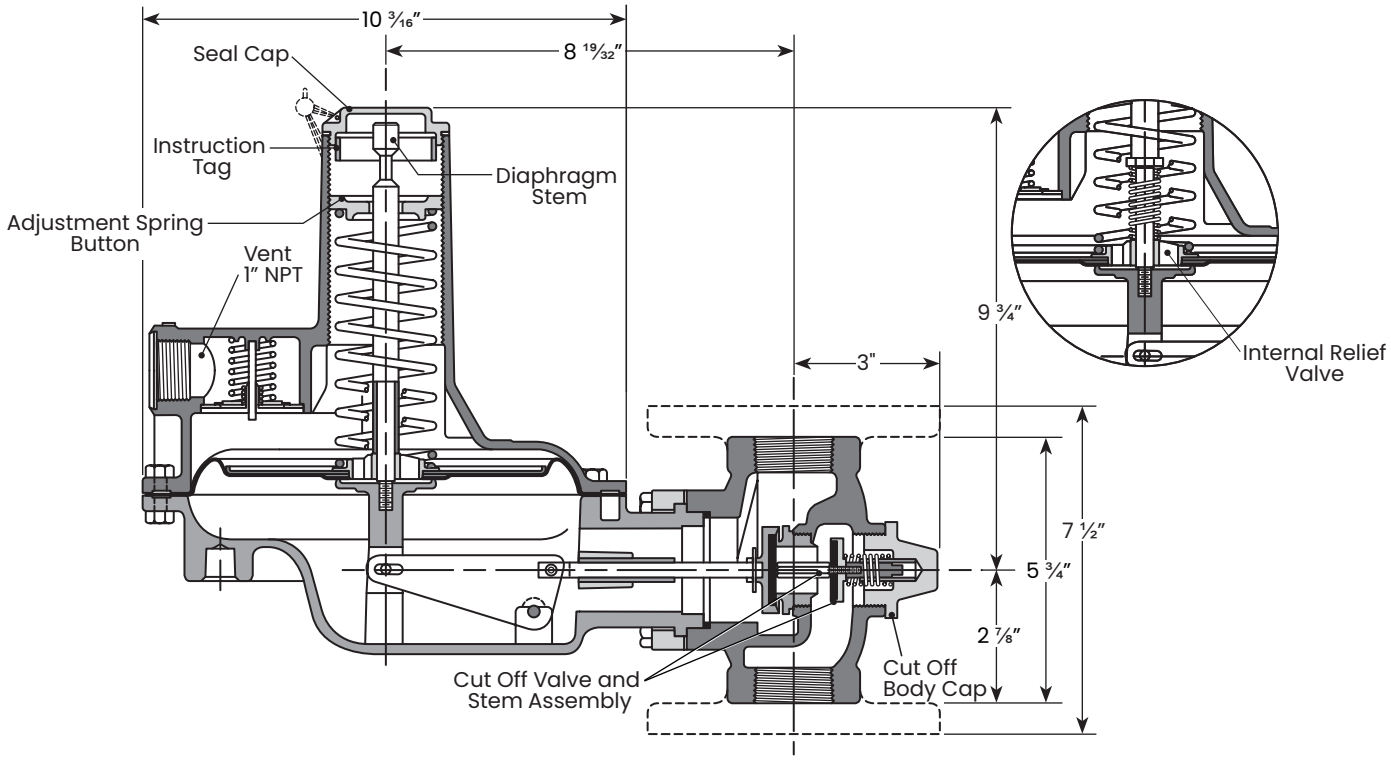
Model	Pipe Size	Orifice Size and Valve Angle			Nominal Diaphragm Size
		1" - 30°	¾" - 10°	½" - 10°	
243-8-6	1 ¼"	-	15 psi	40 psi	8"
	1 ½"	25 psi	25 psi	60 psi	
	2"	25 psi	25 psi	60 psi	
243-12-6	1 ½"	25 psi	40 psi	60 psi	12"
	2"	25 psi	40 psi	75 psi	

Spring Ranges

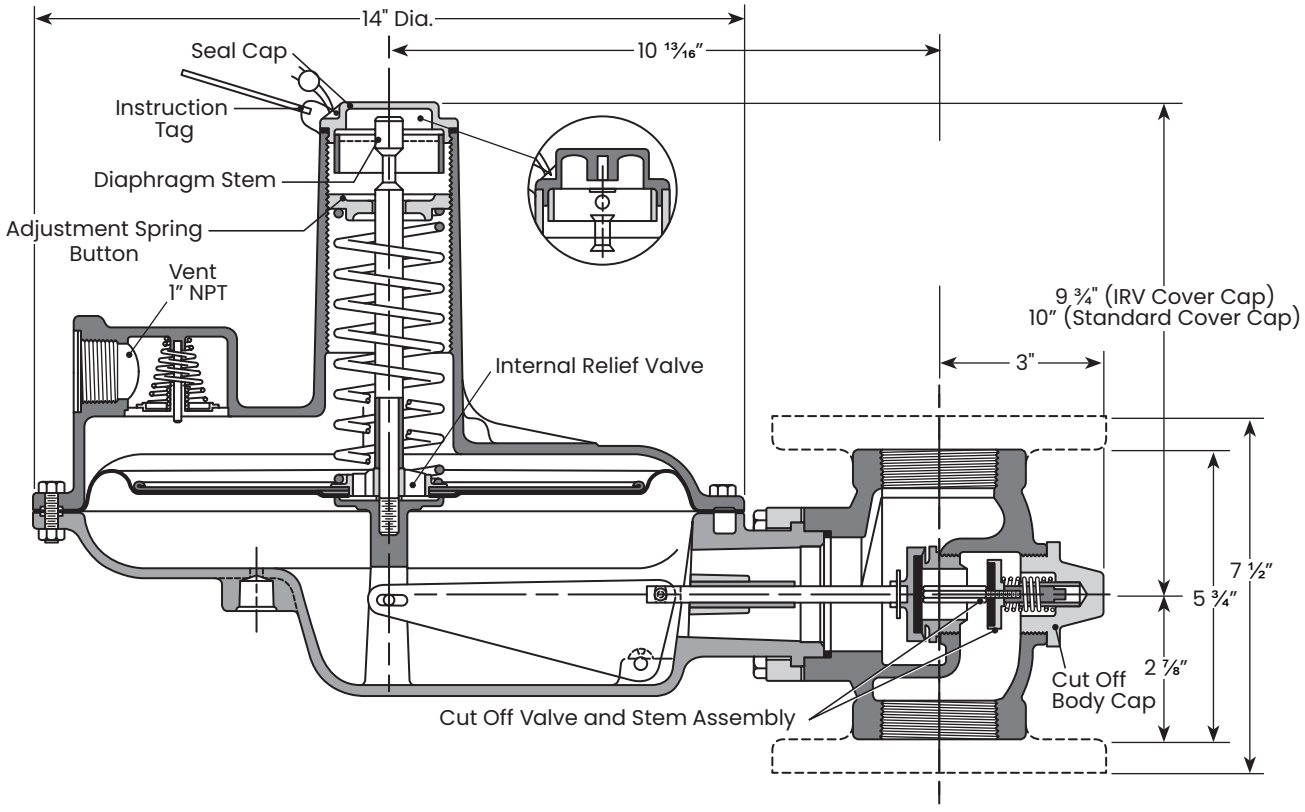
Spring Color	Outlet Pressure		Part Number
	243-12-6	243-8-6	
Red-Black	-	5" to 8" w.c.	143-82-021-00
Blue-Black	-	6" to 12" w.c.	143-82-021-01
Green-Black	-	8" to 18" w.c.	143-82-021-02
Red	4" to 7" w.c.	-	143-16-021-03
Blue	6" to 9 ½" w.c.	-	143-16-021-04
Green	8" to 16" w.c.	16" to 30" w.c.	143-16-021-05
Orange/Black	12" to 20" w.c.	-	143-16-021-11
Orange	16" to 30" w.c.	-	143-16-021-06

Features and Dimensions

Model 243-8-6



Model 243-12-6



1 ½" Model 243-8-6

Measurements in SCFH of Natural Gas
(0.6 Specific Gravity - 14.65 psi - 60°F)

Outlet Pressure and Spring	Inlet Pressure psi	Orifice Size and Valve Angle		
		1"	¾"	½"
		30°	10°	10°
6" w.c. 1" w.c. Droop Red-Black Spring 5" to 8" w.c. 143-82-021-00	2	2,700	1,700	-
	5	4,400	2,900	1,300
	10	6,200	4,300	2,000
	15	7,800*	5,400	2,600
	25	-	7,300*	3,800
	40	-	-	5,400
	60	-	-	7,000*
7" w.c. 1" w.c. Droop Blue-Black Spring 6" to 12" w.c. 143-82-021-01	2	2,500	1,400	-
	5	4,100	2,400	1,300
	10	6,100	4,100	2,000
	15	7,800*	5,200	2,600
	25	-	7,200*	3,800
	40	-	-	5,400
	60	-	-	7,000*
11" w.c. 3" w.c. Droop Green-Black Spring 8" to 18" w.c. 143-82-021-05	2	2,700	1,650	-
	5	4,400	2,900	1,300
	10	6,200	4,300	2,000
	15	7,800*	5,400	2,600
	25	-	7,300*	3,800
	40	-	-	5,400
	60	-	-	7,000*
18" w.c. 3" w.c. Droop Green Spring 16" to 30" w.c. 143-16-021-05	2	2,200	1,500	-
	5	4,200	2,800	1,300
	10	6,200	2,800	1,300
	15	7,800*	5,500	2,600
	25	-	7,500*	5,400
	40	-	-	7,000*
	60	-	-	
1 psi 3" w.c. Droop Green Spring 16" to 30" w.c. 143-16-021-05	2	2,200	1,500	-
	5	4,250	2,800	1,300
	10	6,275	4,350	2,000
	15	7,900*	5,550	2,600
	25	-	7,600*	3,800
	40	-	-	5,450
	60	-	-	7,100*

* At the inlet pressure and orifice size shown for each asterisked capacity, regulator should not be adjusted for a pressure lower than the indicated outlet pressure.

1 ¼" Model 243-8-6

Measurements in SCFH of Natural Gas
(0.6 Specific Gravity - 14.65 psi - 60°F)

Outlet Pressure and Spring	Inlet Pressure psi	Orifice Size and Valve Angle	
		¾"	½"
		10°	10°
6" w.c. 1" w.c. Droop Red-Black Spring 5" to 8" w.c. 143-82-021-00	2	1,300	-
	5	1,400	1,250
	10	2,400	1,800
	15	2,800	2,200
	25	-	2,600
	40	-	3,500
7" w.c. 1" w.c. Droop Blue-Black Spring 6" to 12" w.c. 143-82-021-01	2	1,200	-
	5	1,800	1,100
	10	2,300	1,700
	15	2,700	2,200
	25	-	2,600
	40	-	3,500
11" w.c. 3" w.c. Droop Green-Black Spring 8" to 18" w.c. 143-82-021-05	2	1,350	-
	5	2,100	1,300
	10	2,800	2,000
	15	3,300	2,500
	25	-	3,200
	40	-	4,000
18" w.c. 3" w.c. Droop Green Spring 16" to 30" w.c. 143-16-021-05	2	1,350	-
	5	2,200	1,300
	10	2,900	2,000
	15	3,400	2,500
	25	-	3,200
	40	-	4,000
1 psi 3" w.c. Droop Green Spring 16" to 30" w.c. 143-16-021-05	2	1,350	-
	5	2,200	1,300
	10	2,900	2,000
	15	3,400	2,500
	25	-	3,200
	40	-	4,050

2" Models 243-12-6

Measurements in SCFH of Natural Gas
(0.6 Specific Gravity - 14.65 psi - 60°F)

Outlet Pressure and Spring	Inlet Pressure psi	Orifice Size and Valve Angle		
		1"	¾"	½"
		30°	10°	10°
6" w.c. 1" w.c. Droop Red Spring 4" to 7" w.c. 143-16-021-03	2	3,600	2,300	-
	5	5,200	3,400	1,800
	10	7,800	4,400	2,500
	15	10,000	5,700	3,100
	25	13,000*	8,000	4,000
	40	-	11,000*	5,500
	60	-	-	7,300
	75	-	-	8,700*
7" w.c. 1" w.c. Droop Blue Spring 6" to 9 ½" w.c. 143-16-021-04	2	3,500	2,100	-
	5	5,200	3,100	1,500
	10	7,800	4,400	2,100
	15	10,000	5,700	3,000
	25	13,000*	8,000	4,000
	40	-	11,000*	5,400
	60	-	-	7,000
	75	-	-	8,500*
11" w.c. 2" w.c. Droop Green Spring 8" to 16" w.c. 143-16-021-05	2	3,500	2,300	-
	5	5,200	3,200	1,700
	10	7,700	4,400	2,100
	15	10,000	5,700	3,000
	25	13,000*	8,000*	4,000
	40	-	11,000*	5,400
	60	-	-	7,100
	75	-	-	8,000*
18" w.c. 3" w.c. Droop Orange Spring 16" to 30" w.c. 143-16-021-06	2	3,300	2,200	-
	5	5,100	3,300	1,700
	10	7,700	4,400	2,300
	15	9,800	5,700	3,000
	25	13,000*	8,000*	4,000
	40	-	11,000*	5,500
	60	-	-	7,300
	75	-	-	8,700
1 psi 3" w.c. Droop Orange Spring 16" to 30" w.c. 143-16-021-06	2	3,300	2,200	-
	5	5,150	3,300	1,700
	10	7,800	4,450	2,300
	15	9,900	5,750	3,000
	25	13,150*	8,100	4,050
	40	-	11,000*	5,050
	60	-	-	7,400
	75	-	-	8,750*

* At the inlet pressure and orifice size shown for each asterisked capacity, regulator should not be adjusted for a pressure lower than the indicated outlet pressure.

1 ½" Models 243-12-6

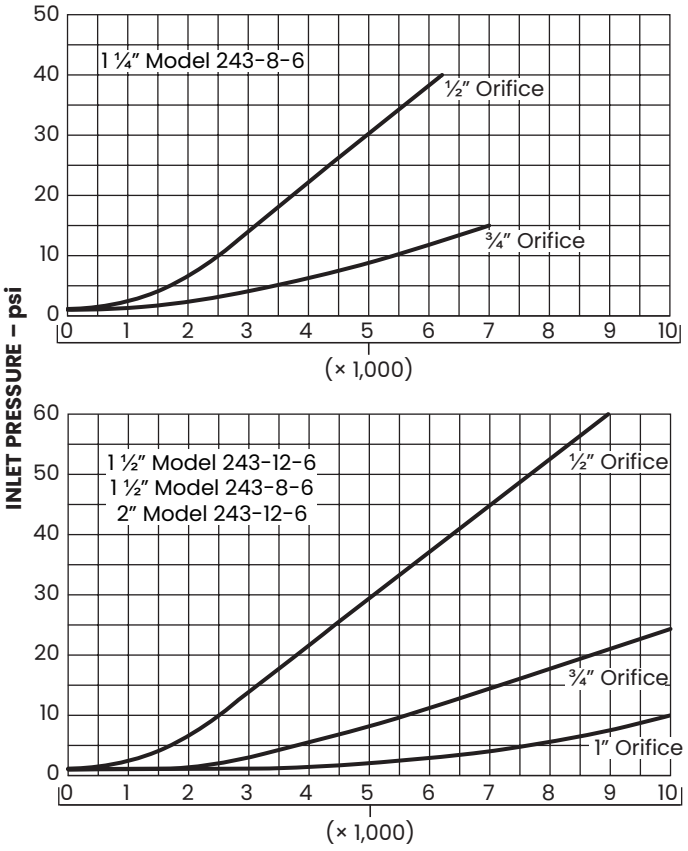
Measurements in SCFH of Natural Gas
(0.6 Specific Gravity - 14.65 psi - 60°F)

Outlet Pressure and Spring	Inlet Pressure psi	Orifice Size and Valve Angle		
		1"	¾"	½"
		30°	10°	10°
6" w.c. 1" w.c. Droop Red Spring 4" to 7" w.c. 143-16-021-03	2	3,200	1,800	-
	5	4,600	3,000	1,400
	10	6,400	4,300	2,100
	15	8,000	5,600	3,000
	25	11,000*	7,700	4,000
	40	-	10,000*	5,400
	60	-	-	7,000
7" w.c. 1" w.c. Droop Blue Spring 6" to 9 ½" w.c. 143-16-021-04	2	3,000	1,800	-
	5	4,500	3,000	1,400
	10	6,200	4,300	2,100
	15	7,600	5,600	3,000
	25	11,000*	7,600	4,000
	40	-	10,000*	5,400
	60	-	-	7,000
11" w.c. 2" w.c. Droop Green Spring 8" to 16" w.c. 143-16-021-05	2	3,200	1,700	-
	5	4,600	3,000	1,400
	10	6,400	4,300	2,100
	15	8,000	5,600	3,000
	25	11,000*	7,700	4,000
	40	-	10,000*	5,400
	60	-	-	7,000
18" w.c. 3" w.c. Droop Orange Spring 16" to 30" w.c. 143-16-021-06	2	2,800	1,600	-
	5	4,500	3,000	1,400
	10	6,300	4,300	2,100
	15	8,000	5,600	3,000
	25	11,000*	7,700	4,000
	40	-	10,000*	5,400
	60	-	-	7,000
1 psi 3" w.c. Droop Orange Spring 16" to 30" w.c. 143-16-021-06	2	2,800	1,600	-
	5	4,550	3,000	1,400
	10	6,400	4,350	2,100
	15	7,900	5,650	3,000
	25	11,100*	7,800	4,050
	40	-	10,100*	5,450
	60	-	-	7,100*

* At the inlet pressure and orifice size shown for each asterisked capacity, regulator should not be adjusted for a pressure lower than the indicated outlet pressure.

LPCO Operation Curves

The curves, in the graphs below, show the relationship between inlet pressure, flow, and cut off. At a given flow, cut off occurs when inlet pressure drops below the indicated value. Conversely, at a given inlet pressure, cut off occurs when flow exceeds the indicated amount.



Flow – SCFH Natural Gas (0.6 Specific Gravity)

CAUTION

Regulators are pressure control devices with numerous moving parts subject to wear that is independent upon particular operating conditions. To ensure continuous satisfactory operation, a periodic inspection schedule must be adhered to with the frequency of inspection determined by the severity of service and applicable laws and regulations.

NOTE: The use of an internal or external relief valve is recommended for installations subjected to no-flow conditions for extended periods of time, such as pilot-less ignition systems. A travel stop stem comes in the 243-12-1 to provide overpressurization protection to internal components, during overpressurization lockup.

Installation and Start Up

1. Follow the procedures given in document USG-IMM-019 "Regulator Installation and Maintenance" for the 243.
2. The LPCO must be manually opened to put the regulator into operation. The LCPO is normally in the closed position on an uninstalled regulator. To open the LPCO, remove the seal cap and pull up on the diaphragm stem. Hold in the upward position until it stays in this position by itself.
3. Once the LPCO is in operation, the final set point adjustment can be made with the adjustment spring button.

Servicing

4. Follow the procedures given in document USG-IMM-019 "Regulator Installation and Maintenance" for the 243.
5. Remove the cut off body cap for access to the cut off valve and stem assembly. Make certain all parts are reassembled in their correct order.

NOTE: Refer to the parts list for the 243 in document USG-PL-034 for cut off parts.

Maximum Emergency Pressure

The maximum pressure the regulator inlet may be subject to under abnormal conditions without causing damage to the regulator is the maximum inlet pressure (from the table on Page 1) plus 10 psi.

The maximum pressure the diaphragm may be subject to without causing damage to the internal parts of the regulator are:

243-12-6, and 243-8-6 ..... set-point + 5 psi

CAUTION

If any of the pressure limits are exceeded, the regulator must be taken out of service and inspected. All damaged or otherwise unsatisfactory parts must be repaired or replaced.

The maximum pressure that can be safely contained by the diaphragm case are:

243-12-6 ..... 15 psi
243-8-6 ..... 15 psi

NOTE: "Safely contained" means no leakage as well as no bursting.

Before using any of the above data, make sure this entire section is clearly understood.

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